Approaches for practical use of the Free Mobility Assistance Project

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ABSTRACT

This project aims to create environments in which anyone can obtain information on his destination, suitable routes and transportation measures for him, etc., which are necessary to work and perform social activities, at anywhere and anytime.

The project is one of the measures to create a universal society in which people support each other and make the most of their abilities. Technologies and systems have been developed through experiments for five years.

As a consequence, the effectiveness was verified in route searches and information of movement guidance and the equipment full practicality. The roles of the public and private sectors in the project was also proposed.

1. Introduction

Japan has entered an era of rapid population aging and unprecedented population shrinkage, due to a progressive decline in the birth rate. These trends give room for concern over a manpower shortage in Japan, as well as their impact on the sustainable growth of Japan's socio-economy. In order to build, maintain and develop an affluent, vibrant society in spite of these trends, we need to create a "universal society" in which all people will be able to manifest their abilities and support each other. To this end, it is vital that we create an environment in which everyone can move smoothly and safely from place to place.

These demands have led to the enactment of the Law for Buildings Accessible to and Usable by the Elderly and Physically Disabled Persons (referred to below as "the Heart Building Law") and the Law for Promoting Easily Accessible Public Transportation Infrastructure for the Aged and the Disabled ("the Barrier Free Transport Law"). These provide for the promotion of "hard" barrier-free measures in designated buildings, public transport, roads around stations and other passenger facilities, etc. In 2006, the Heart Building Law and the Barrier Free Transport Law were integrated and amplified with the enactment of the Law for Promoting Easy Mobility and Accessibility for the Aged and the Disabled ("the New Barrier Free Law"). Uniform and comprehensive barrier-free measures are now being promoted in line with this Law.

In our efforts to make transit environments barrier free, it is important that we approach measures for improvement not only in "hard", tangible terms but also in "soft", intangible aspects. The latter would include providing information to support human locomotion, with a view to creating an

environment in which everyone, including the elderly and disabled, can move smoothly and safely from place to place.

Given this background, the Free Mobility Assistance Project is one initiative aimed at achieving a “universal society”. Its objective is to use a free mobility assistance system based on ubiquitous technology to create an environment in which information on transit routes, means of transport, destinations and others needed for social participation, employment and other activities can be obtained “at any time”, “in any place” and “by anyone”, regardless of their physical condition, age, language, etc.

Ubiquitous technology creates value by fitting semiconductor devices to a wide variety of target objects and using these in diverse ways. Multi-faceted research and development is considered necessary before this technology can be used. As part of this, steps are now being taken, in government plans such as the 3rd Science & Technology Basic Plan and the New IT Reform Strategy, to commercialize free mobility assistance systems based on ubiquitous technology and to gradually deploy them in the community, with a target for introduction in fiscal 2010.

2. An outline of the free mobility assistance system

Providing route information according to the location and in response to user attributes depends on finely detailed and highly precise positional identification. To achieve the objective of the Free Mobility Assistance Project, therefore, we decided to use ubiquitous technology, which arranges computers(e.g.”IC tags”) in various locations and objects and can provide information on those locations and objects. The free mobility assistance system consists of “location information codes”, “positional identification infrastructure”, “pedestrian space network data”, “facility data”, “application and service functions” and “mobile information terminals”, and this composition complies with international standards (ITU-T Recommendation H.621 and ITU-T Recommendation F.771) (see Fig. 1). To obtain information on the current location, the user’s current location is identified on the basis of positional identification infrastructure, and information is received after accessing various facility data and external databases wherever necessary. By collating these with internal pedestrian space network data, the user can receive services related to mobility support, such as recognition of current location and route directions in accordance with the user’s search conditions (e.g. guidance on ordinary routes and wheelchair user routes).

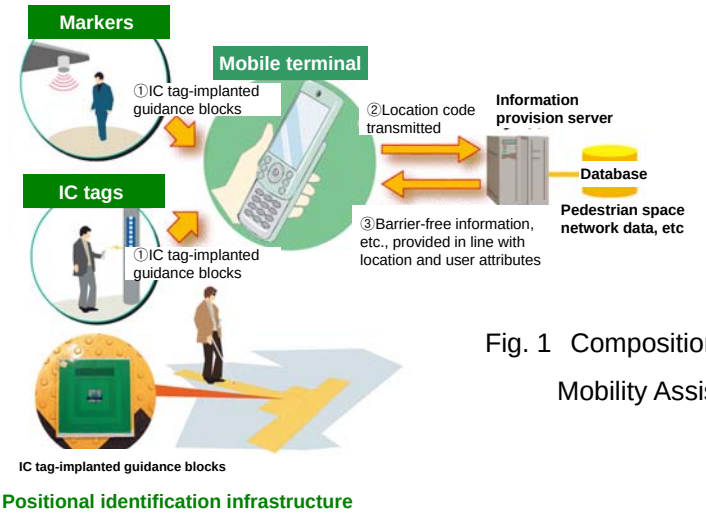


Fig. 1 Composition of the Free Mobility Assistance System

3. An outline of initiatives in the Free Mobility Assistance Project

In this Project, initiated by the Ministry of Land, Infrastructure and Transport, demonstration experiments have been held under various environmental conditions and technical and system aspects have been studied, with a view to achieving a free mobility assistance system with the use of ubiquitous technology. A timeline of initiatives is shown below (see Fig. 2).

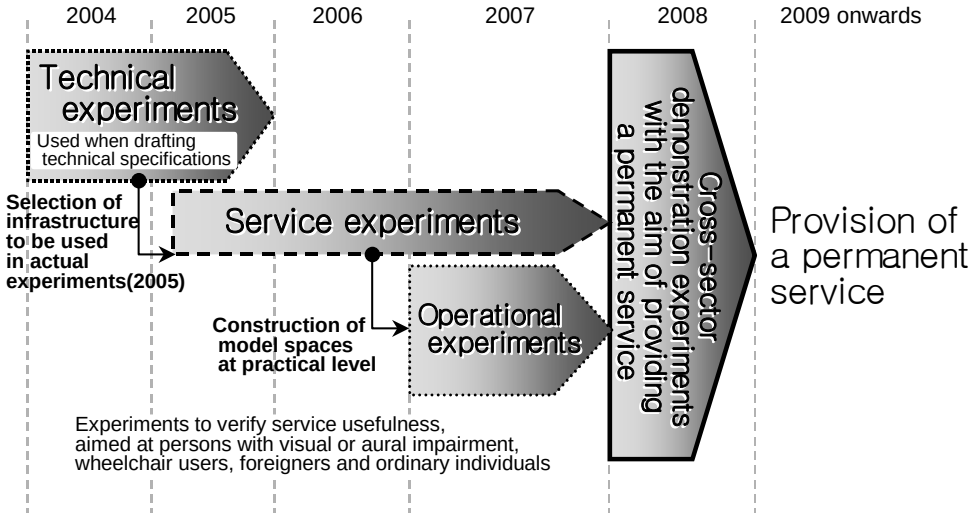


Fig. 2 Timeline of the Project

In fiscal 2004, as well as establishing the concept of the Free Mobility Assistance Project, we verified the element technology that comprises the system and confirmed the feasibility of the positional identification infrastructure. Moreover, ucode is a very flexible code system, and it was assumed that various things were able to be recognized, to be identified. We also decided to use ucode for the location information codes.

In fiscal 2005, we conducted demonstration experiments in four sites around Japan (Aomori, Tokyo (Ueno), Aichi EXPO and Kobe) canvassing people such as disabled people, tourist, and local resident as monitors. We verified the topics of information provided, the operability of the system, methods of providing information in accordance with the target's physical condition, and other aspects.

We then prepared Technical Specifications (Draft) and Service Definitions (Draft) based on the results of this verification.

In fiscal 2006, we moved to experimental deployment based on the Technical Specifications (Draft), etc., and held demonstration experiments in eight sites around the country (Aomori, Tokyo (Ginza), Shizuoka, Kobe, Nara, Sakai (Osaka Prefecture), Nachi Katsuura (Wakayama Prefecture) and Kumamoto). Under diverse environmental conditions, we repeatedly held demonstration experiments targeting users with various different characteristics, and revised the Technical Specifications (Draft). We also drew up “Guidelines on Data Security for Free Mobility Assistance System” to reduce the data risk accompanying the free mobility assistance system, as well as protecting users, promoting the diffusion of the system and promoting smooth and proper use.

In fiscal 2007, with a view to providing a permanent service, we first organized our rationale on introducing the service in stages. We then created a “Draft Service Content” outlining the service and specifying the targets of information provision, the content of information provided, the timing of information provision, means of providing information, and so on. At the same time, we drew up a “Joint Public-Private Sector Division Model (Draft)” and set out principles for deployment based on a division of roles between the public and private sectors. We also revised the “Positional Identification Infrastructure Equipment Specifications (Draft)” from the viewpoint of relevance as technical requirements and ordering specifications. We formulated “Guidelines for the Creation of Pedestrian space Network Data (Draft)” to ensure the smooth creation and exchange of barrier information on walking routes. Finally, to acquire the data needed for these studies, we carried out demonstration experiments in eight sites around the country (Aomori, Tokyo (Ginza), Shizuoka and Toyota (Aichi Prefecture), Kobe and Nara, Nachi Katsuura (Wakayama Prefecture) and Kumamoto).

In fiscal 2008, with the aim of providing a permanent service from the following fiscal year onwards, we canvassed private companies and others, and held demonstration experiments in five sites around the country (Tokyo, Toyota, Takayama (Gifu Prefecture), Kobe and Nara) with different roles allocated to the public and private sectors. We also comprehensively verified the specifications for the service, system, infrastructure, etc., from the angles of commercial feasibility and sustainability.

4. Initiatives in the FY2008 demonstration experiments

The purpose of the FY2008 demonstration experiments was to verify the system with a view to obtaining specific materials for study needed to develop the system from FY2009 onwards. Verification topics were set for the whole of the Project. As for the division of roles between public and private sectors, positional identification infrastructure and others would be arranged by the public sector body implementing the experiment, while tourism association and others selected by public canvassing would provide services to be materialized in

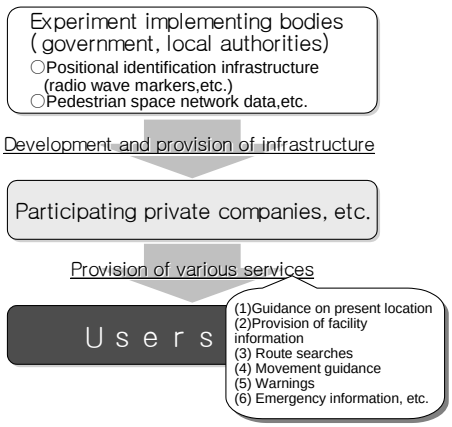


Fig. 3 Division of Roles Between Public and Private Sectors in FY2008 Experiments

the Project (see Fig. 3).

As a result of canvassing for private companies in five locations around the country, applications for participation were received from four consortium. In terms of the services proposed by them, 38 of the 46 services to be materialized in fiscal 2008 were provided (see Table 1). We verified the proposed content and its usefulness for users in accordance with local characteristics.

At the same time, we also verified the services comprehensively in terms of the usefulness of the system, the specifications of infrastructure, etc., commercial feasibility and sustainability.

Table 1 Proposals from Participating Companies for Project Services to be Materialized in FY2008

Services to be materialized in FY2008		Physical objects and routes subject to provision of information, and content of information provided		Provided / Not provided
Category	Subcategory			
Guidance on present location	Display of present location	● Map display showing present location		○
	Guidance based on landmarks in present location	● Guidance on present location based on address		○
		● Guidance on present location based on street and intersection names		○
		● Guidance on present location based on position relative to departure location and destination		○
		● Guidance on present location based on position relative to stations and other areas passed, etc.		○
		● Guidance on present location based on position relative to local landmarks, etc.		○
		● Function for registration of landmarks by users		×
		● Function for ascertaining direction of movement (particularly for visually impaired)		○
Provision of facility information	Provision of information on destination facility	● Search and provision of information on roadside facilities near present location or any chosen location		○
		Search targets	WCs for public use, public facilities, hospitals, evacuation sites, etc.	
	Provision of information on highly public facilities that can be used by the disabled	● WCs for public use (search and provision of information on whether usable by the disabled)		○
		● Evacuation sites designated by local authorities (search and provision of information on whether usable by the disabled)		○
		● Other facilities of a highly public nature (search and provision of information on whether usable by the disabled)		○
	Provision of information on destination facilities that can be used by the disabled	● Destination facilities (search and provision of information on whether usable by the disabled)		○
Route searches	Search for shortest route between two points	● Search for shortest route from departure location to destination set by the user		○
		● Search for shortest route from present location to destination set by the user		○
	Search for shortest route including public transport	● Search for shortest route from departure location to destination set by the user (including use of public transport)		○
		● Search for shortest route from present location to destination set by the user (including use of public transport)		○
	Search for barrier-free route passable by disabled, taking account of route attributes	Route search conditions	● Stairs	○
			● Escalators	○
			● Elevators	○
			● Width	○
			● Steps	○
			● Existence of sidewalk	○
		● Inclines shown on map if included in route		○
	Route search reflecting whether or not wheelchairs can board trains or buses	Route search conditions	● Railways and buses compatible with wheelchair use	×
Movement guidance	Guidance on movement routes at junctions and turnings	● Guidance on direction towards destination		○
		● Guidance on arrival at destination		○
		● Guidance on direction, distance and other aspects of destination (when requested by user)		○
	Guidance on bus stops, boarding platforms and others where there is no (or little) likelihood of change	● Guidance on arrival at bus-stop ● Guidance on destination of bus to be boarded, scheduled time and bus-stop for alighting		○
		● Guidance on arrival at platform ● Guidance on platform and destination of train to be boarded, scheduled time and station for alighting		×
		● Advance guidance on bus-stop, etc., for alighting while on board		×
	Guidance on appropriate action for automatic doors, ordinary doors, elevators and other places where operation or action is required	● Whether stairs or escalators are going up or down		○
		● Floor at which to leave the elevator		○
		● Guidance on passing entrance or exit of building, etc. ● Guidance on type of door		×
		● Guidance on passing through ticket gate		×
		● Guidance on arrival at level crossing(railroad crossing)		×
		● Guidance on arrival at pedestrian crossing ● Guidance on existence of traffic lights and whether button-operated		○
	Movement guidance on appropriate routes when user has strayed from the guided route, such as turning at the wrong intersection	● Guidance on straying from guided route and on the direction for returning to it		○
	-	● User can pre-set a physical object or pedestrian environment for guidance		○
Warnings	Warning when physical objects are fixed along the route	● Existence of stairs or escalator		○
		● Existence of level crossing(railroad crossing)		×
		● Existence of pedestrian crossing ● Existence of traffic lights and whether button-operated		○
		● Guidance on passing along a road without a sidewalk, or that a section of road without a sidewalk has ended, and the existence of roads without sidewalks		○
		● Existence of uncovered ditches, water conduits, etc.		○
		● User can pre-set a physical object or pedestrian environment for warning		○
Emergency information	Provision of information on the nearest evacuation site	● Provision of information on facility to become nearest evacuation site in the event of a disaster		○

Table 2 Topics for Verification in the FY2008 Demonstration Experiment

Category	Verification Topics
Usefulness of the service content	· Evaluation of 6 services in terms of the content of information provided, method of provision and timing of provision · Evaluation related to service upgrades among the 6 services
Practicality of mobile terminals, etc	· Verification of the practicality of mobile terminals · Verification of the practicality of various applications for materializing the service
Practicality of infrastructure equipment and data	· Verification of the practicality of positional identification infrastructure equipment · Verification related to installation and maintenance of positional identification infrastructure equipment · Verification of the practicality of pedestrian space network data
Evaluation of business feasibility	· Evaluation of users' intention to use the service and willingness to pay · Calculation of cost for developing positional identification infrastructure equipment and cost of maintenance & management · Calculation of cost for developing pedestrian space network data and cost of maintenance & management · Calculation of other investments and running costs needed at the continuous deployment stage · Evaluation of commercial feasibility from the viewpoint of private companies, etc.
Evaluation of sustainability	· Studies on the division of roles, cost burdens, etc., among the government, local authorities, public transport providers, managers of large-scale passenger terminal facilities, etc. · Studies on division of roles, cost burdens, etc., between public and private sectors · Studies on collaboration with NPOs, etc. · Arrangement of conditions for project participation by private companies, etc. · Studies on methods of disclosing pedestrian space network data, etc. (including the nature of the organization for management and disclosure, etc.) · Studies on conditions for private-sector use of positional identification infrastructure and pedestrian space network data · Studies on security and privacy measures, and the handling of liability for defects in warning services

Table 3 Numbers of Experiment Participants in Each Site

Site	Duration	Wheelchair and baby buggy users	Persons with visual impairment	Persons with hearing impairment	Foreigners	Ordinary users	Total
Ginza	Feb. 10 – Mar. 6 25days	1	6	2	28	865	902
Takayama	Feb. 14 – Mar. 1 16days	5	-	1	16	323	345
Toyota	Feb. 9 – Feb. 22 14days	6	2	7	-	199	214
Kobe	Feb. 6 – Feb. 26 18days	18(9)	30	2	15	415	480
Nara	Jan. 20 – Feb. 8 20days	12	-	6	34	353	405
Total		42(9)	38	18	93	2,155	2,346

※ In parentheses under "Wheelchair and baby buggy users" = Baby buggy users only

4.1 Initiatives in the Tokyo site

Since the Tokyo (Ginza) site includes underground spaces, there is a need for smooth guidance of movement from underground to above ground. This is one of Japan's best known commercial areas;

there are commercial facilities all over the site, which is also visited by many foreign tourists. As such, another characteristic of the site is that information needs to be provided in multiple languages. We therefore provided a seamless service to guide movement from underground to above ground in accordance with user attributes. We carried out comprehensive verification and evaluation through collaboration between public and private sectors, with the ultimate aim of providing a permanent service.

4.2 Initiatives in the Takayama site (Gifu Prefecture)

Takayama City in Gifu Prefecture is promoting urban development based on barrier-free, universal design. The area targeted by the experiment stretches from JR Takayama Station to the “old town quarter”, the principal tourist attraction. Since the main tourist facilities, public facilities and others are concentrated here, tourists require guidance on movement. Also, since the site is visited by many foreigners, another characteristic is that tourist and other information must be provided in multiple languages. We therefore provided services in accordance with user attributes. We carried out comprehensive verification and evaluation through collaboration between public and private sectors, with the ultimate aim of providing a permanent service.

4.3 Initiatives in the Toyota site (Aichi Prefecture)

In Toyota City, Aichi Prefecture, we carried out a demonstration experiment on the assumption of access to the experimental site by railway, bus and other means of public transport. This site includes a stratified structure consisting of an above-ground area and a pedestrian deck. Another characteristic of the area is that it is already providing tourist and local information via “Michi Navi Toyota” and other sites operated by Toyota City. We therefore provided a pedestrian movement support service for a complex environment in which GPS cannot be reliably received, e.g. inside the station or below the pedestrian deck, in accordance with user attributes. We carried out comprehensive verification and evaluation through collaboration between public and private sectors, with the ultimate aim of providing a permanent service.

4.4 Initiatives in the Kobe site

In Kobe, the experiment was conducted in the area around Sannomiya and at Kobe Airport. The area around Sannomiya (Sannomiya Station) is a concentrated hub for public transport featuring numerous transfers between different modes of transport, while the area around Sannomiya station itself contains underground malls, large department stores and many tourist attractions (such as Nankinmachi Chinatown). In other words, this is a transport hub that includes underground spaces, and the site is characterized by a need for smooth guidance of movement from underground to above ground. We therefore provided a seamless movement guidance service (including the use of public transport) from underground to above ground in accordance with user attributes. We carried out comprehensive verification and evaluation through collaboration between public and private sectors, with the ultimate aim of providing a permanent service.

4.5 Initiatives in the Nara site

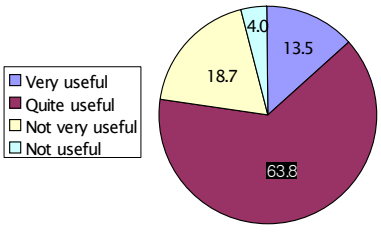
The Nara site is an area including “the cultural treasures of the old capital Nara”, registered as a world heritage site. Since it is visited by many foreigners and other tourists, information needs to be provided in foreign languages. Also, this site covers a wide area consisting of two tourist spots, and the site is characterized by a need for guidance of smooth movement over a wide area. Therefore, as well as providing services in accordance with user attributes, we provided a service to assist smooth wide-area movements between areas. We carried out comprehensive verification and evaluation through collaboration between public and private sectors, with the ultimate aim of providing a permanent service.

5. Outcome obtained and issues arising

5.1 Outcome and issues related to the services and system

To summarize the results of questionnaire surveys held in each site, just under 80% of respondents (including both disabled and non-disabled targets) found the services to be useful. However, parts of the mobile terminal were sometimes found to be unreliable, and various requests for improvement were expressed for different parts of the system, such as “screen display”, “voice-based information”, “provision of information by vibration” and “operability of equipment”. As a task for the future, applications and services will need to be improved by taking account of user interfaces.

Barrier-free route searches and movement guidance were offered as services for wheelchair users, using pedestrian space network data and taking account of steps, access width, etc. About 70% of users felt these services to be “Very useful” or “Quite useful”. However, since the feasibility of movement depends on whether or not there is a carer, the degree of disability, the type of wheelchair, and other factors, the route search function will need to be improved, including these issues.



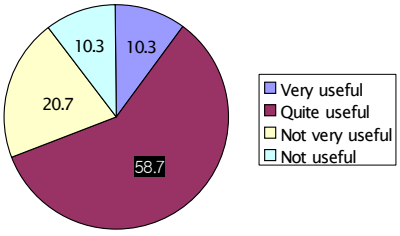


Fig. 4 Usefulness of All Services (left)

Fig. 5 Usefulness of Barrier-Free Route Searches and Movement Guidance Information (right)

As a service for persons with hearing impairment, information was provided using the vibration function of mobile terminals. Just under 80% of users felt this service to be “Very useful” or “Useful”. This reflected the evaluation of the services as a whole. However, it became evident that there were issues with the intensity of vibration in the terminal, while the timing of information provision needed to be made more precise and the vibration should be divided into different types depending on the type of information provided.

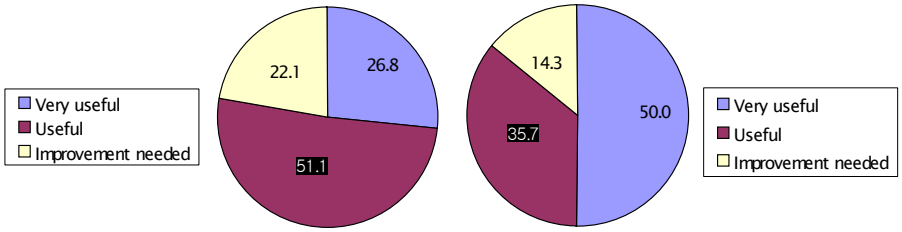


Fig. 6 Usefulness of Services Using the Vibration Function (Left: All Participants, Right: Those With Hearing Impairment)

As a service for persons with visual impairment, movement guidance was provided by combining radio wave markers with guidance blocks for the visually impaired. About 90% of users found this service “Very useful” or “Quite useful”. On the other hand, there were issues in terms of the accuracy of information and providing services with emphasis on timing. Movement guidance using only radio wave markers could not be achieved this time. On the provision of information in multiple languages for foreigners, more than 80% of users evaluated this as “Very useful” or “Quite useful”. However, there were requests for improvements in the reliability and operability of the system. Improvements will be needed in future, including a revision of user interfaces.

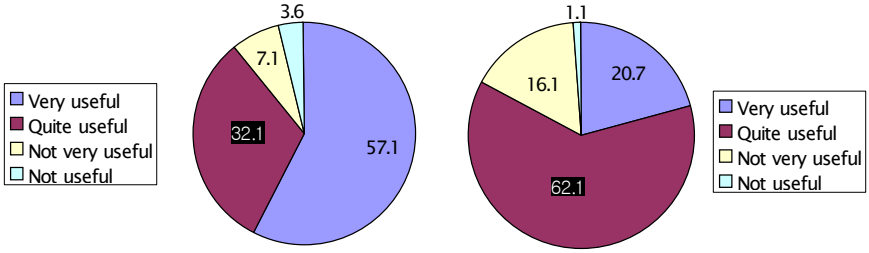


Fig. 7 Usefulness of Movement Guidance Service for Persons with Visual Impairment (left)

Fig. 8 Usefulness of Services Provided to Foreigners (right)

5.2 Outcome and issues related to the specifications of equipment needed for the system

With respect to “location information codes”, in fiscal 2005 we stipulated a requirement that location information codes should be fitted. In demonstration experiments to date, we have used ucode for this purpose, since it has been confirmed to have a reliable degree of practicality. International standards on ID code systems including ucode are currently being discussed by the ITU, and if a recommendation on this subject is issued, it will need to be reflected in the technical specifications.

Concerning the “positional identification infrastructure”, we verified the applicability of seven types (“radio wave markers”, “IC tags”, “IC tag-implanted guidance blocks for the visually impaired”, “QR code tags”, “infrared ray markers”, “Indoor Messaging System (IMES)” and “visible ray communication using lighting fixtures”) in the FY2008 demonstration experiments. As a result, it was thought that “infrared ray markers”, “Indoor Messaging System (IMES)” and “visible ray communication using lighting fixtures” need to be verified in terms of their continued compatibility with international standards and future developments in technology.

In the FY2008 demonstration experiments, we also arranged data and provided services using the pedestrian space network data created in fiscal 2007. As a result, issues emerged when creating data, in that it was uncertain “what part of the road space should be regarded as a pedestrian space”

and it was necessary to do a fine dissemination “the state of the road surface, conditions for passage and other information necessary for guidance on barrier-free routes as linked attribute headings”. It became clear, moreover, that it was different from the initially prescribed data storage format that private service providers used format. Points for improvement in these issues need to be studied and reflected in technical specifications.

Meanwhile, as service facility data needed in order to provide services, we assumed “public toilets”, “public facilities”, “hospitals” and “designated evacuation sites”, and confirmed these in demonstration experiments. As a result, since the facility information needed depends on the content of the service provided, we are re-organizing the data headings to be acquired for each facility and are reflecting these in the technical specifications.

5.3 Outcome and issues related to the division of roles between public and private sectors

With respect to the division of roles when providing a permanent service in future, we created a model whereby public bodies will develop and provide infrastructure, etc., while private companies and others will use these to provide various services (Fig. 9).

Concerning mobile terminals as vehicles for providing services, it is hoped that an indefinitely large number of people will use mobile terminals that they themselves own. However, in the transitional period during diffusion or when providing services within a limited area, mobile terminals may be hired out in some cases. The following two tasks will need to be addressed if services are to be provided permanently in future under the division of roles shown in Fig. 9.

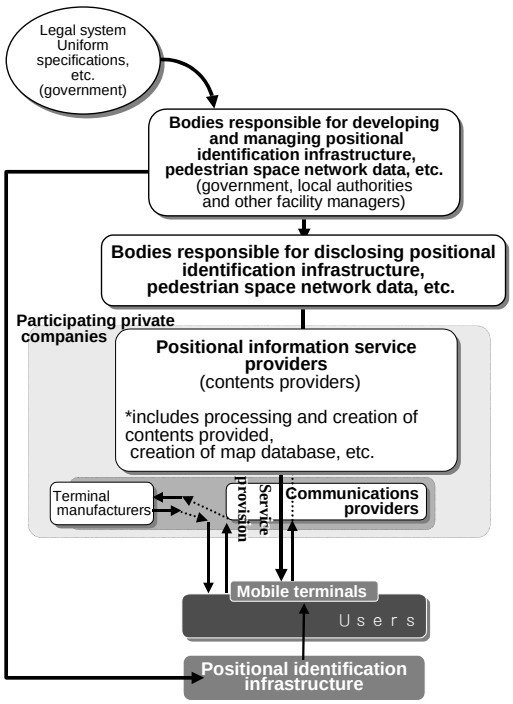


Fig. 9 Image of Role Division Aimed at a Permanent Service

(1) Establishing a project scheme for nationwide development and management of infrastructure, etc.

Developing infrastructure, etc., requires startup funding as well as the considerable cost of management (renewal). On the other hand, various social effects are expected to derive from the provision of services. These would include an improved sense of safety and reassurance due to a decrease in accidents and a lower burden of care when care-receivers venture out of the home. One could also expect greater consumption activity to arise from the increase in opportunities to go outside the home, as well as an increase in local vitality and employment opportunities due to enhanced mobility. Considering these effects, it is thought essential that public bodies should develop positional identification infrastructure, etc. In view of this, when tackling the nationwide development and management of positional identification infrastructure, etc., we should first obtain social consensus before establishing a project scheme based on law, thereby reducing the burden on bodies that develop and manage infrastructure, etc.

(2) Encouraging participation by private businesses, expanding the number of service users (promoting active sales of mobile terminals and provision of services)

To achieve a nationwide diffusion of these services in future, we will need to encourage participation by private businesses. To this end, it will be important to develop information related to positional identification infrastructure, pedestrian space network data, and others as data based on uniform national specifications, and to build a framework whereby these data can be disclosed centrally via the Internet and other media.

However, it may not necessarily be possible for private businesses to achieve commercial profitability based only on the services to be provided by the free mobility assistance system. Therefore, to reduce the business risk for private businesses while promoting active mobile terminal sales and service provision, it is important that we open the system up to a diversity of service developments aimed at a wide range of users, thereby increasing the number of service users. To this end, when formulating and standardizing national specifications or other details of positional identification infrastructure, an important task will be to make the necessary preparations for the project environment. These would include, for example, consideration to ensure that private businesses and others can develop a diversity of services by drawing on their original and creative ideas.

6. Future developments

Thanks to our efforts over the last five years, the element technology that comprises the system to be commercialized has been verified, but we have yet to commercialize a system that can satisfy everyone. For example, it would be possible to guide the movements of persons with visual impairment by combining IC tag-implanted guidance blocks for the visually impaired with white sticks equipped with an IC tag reader function. However, this is based on the premise of movement along guidance blocks for the visually impaired. The current situation is that the system cannot provide the information needed when the user strays away from the blocks. Also, as a service for the visual and hearing impairment, we have materialized a service whereby vibration is used to notify that information has been provided. It is technically feasible for the content of the information to be conveyed by differences in the vibration. However, this has not yet reached fruition.

Nevertheless, by combining the element technology verified in previous demonstration experiments with different types of data communication technology, such as the diffusion and growth of the mobile phone field as pursued by the private sector, it is thought that a series of systems has been created, albeit with limited services. For example, by developing pedestrian space network data and allowing private-sector providers to use them, we have made it possible to search barrier-free routes for which there is a strong need among wheelchair users. Again, combining radio wave markers and other positional identification infrastructure with mobile terminals compatible with the same facilitates movement guidance along the searched route, not only above ground but even in underground spaces and inside buildings.

Although a timeline for commercialization of the technology related to these limited services has been established, many tasks still remain to be resolved, including the problem of development cost,

before they can be provided permanently.

In future, we will need to construct an efficient system of management, as well as spreading the development of positional identification infrastructure and pedestrian space network data nationwide, after first allocating the respective roles of the public and private sectors. Meanwhile, improvements to the service content, method of provision, user interfaces and so on, can be cited as issues to be resolved with a view to commercialization. From fiscal 2009 onwards, while taking steps to solve these issues, we must continue positive efforts towards development in the community, in tandem with surveys, studies and the development of technology. In this way we can ensure that all services can be provided, including those that could not previously be provided. The Ministry of Land, Infrastructure and Transport is planning to create a “Mobility Support Model Project” in fiscal 2009, and to support efforts by local authorities and others. By spreading the outcome obtained from this Project horizontally across the entire nation, the aim is to diffuse free mobility assistance systems based on ubiquitous technology.

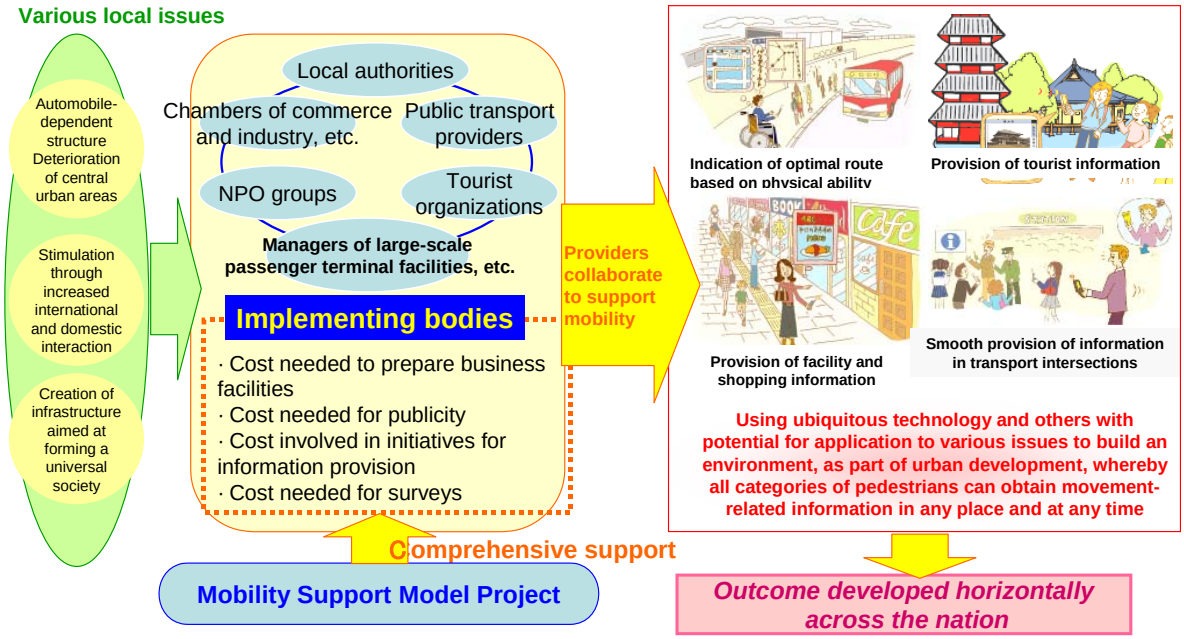


Fig. 10 Image of the Mobility Support Model Project

To combine the outcome and issues from the past five years with the outcome of the new project and make it easily usable for all users, it is important to be able to provide information on movement needed “by you, here and now”.

In future, we expect to materialize a universal society at the earliest possible juncture with a view to creating a vibrant nation, by further widening the possibilities of the Project while at the same time promoting the actual deployment of free mobility assistance systems in society. In this context, we must not forget that it is important to have a “compassionate social foundation” in which everyone helps each other.